UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 70002

CSAH 101

OVER

THE MINNESOTA RIVER

DISTRICT M - SCOTT COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 70002, Piers 3, 4 and 5, were found to be in good condition with no structurally significant defects observed. Several vertical hairline cracks were observed on all piers. Moderate accumulations of timber debris were observed at Piers 3 and 4. The channel bottom around the substructure units appeared stable with no evidence of significant scour.

INSPECTION FINDINGS:

(A) Several random vertical cracks were observed extending from top of the ledge in the pier shaft to the channel bottom with efflorescence along the cracking. Typically there were two cracks on each pier at about the third points of the shaft.

(B) Moderate to heavy accumulation of timber debris consisting of logs and branches 12 to 15 inches in diameter and smaller was observed along the south face, around the upstream nose, and to about the mid-point on the north face of Pier 3, extending from the waterline to the channel bottom.

(C) A moderate accumulation of timber debris was observed from the upstream nose to the upstream quarter points on both sides of Pier 4.

(D) A scour depression 5 feet in radius by 2 feet deep was observed at the upstream end of Pier 4.

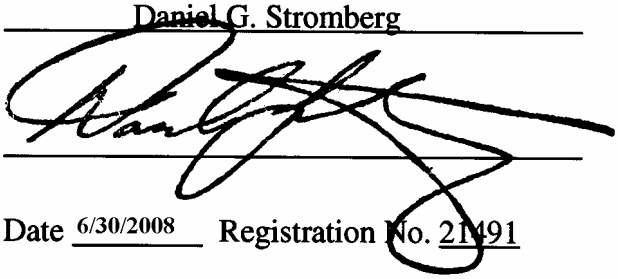
RECOMMENDATIONS:

(A) Monitor the timber debris at the piers, and if found to be increasing in the future, removal operations may become warranted.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

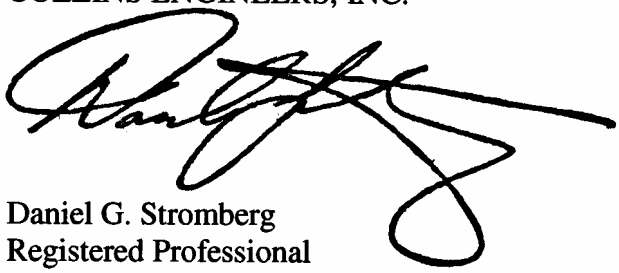
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 70002

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 101

Location: District M - Scott County

Bridge Description: The superstructure is a seven span, multiple concrete girder bridge. The superstructure is supported by two reinforced concrete abutments and six reinforced concrete piers. The piers are numbered 1 through 6 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: November 19, 2007

Weather Conditions: Cloudy, 50° F

Underwater Visibility: 0.5 feet

Waterway Velocity: 1.0 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 3, 4 and 5.

General Shape: All piers consist of oblong rectangular concrete shafts with rounded ends that rest on rectangular footings/seals founded on steel H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 16.2 feet.

4. WATERLINE DATUM

Water Level Reference: The top of ledge in shaft at the downstream end of Pier 4.

Water Surface: The waterline was approximately 4.4 feet below reference.
Waterline elevation = 691.1.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/11/07

Item 113: Scour Critical Bridges: Code F/07

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

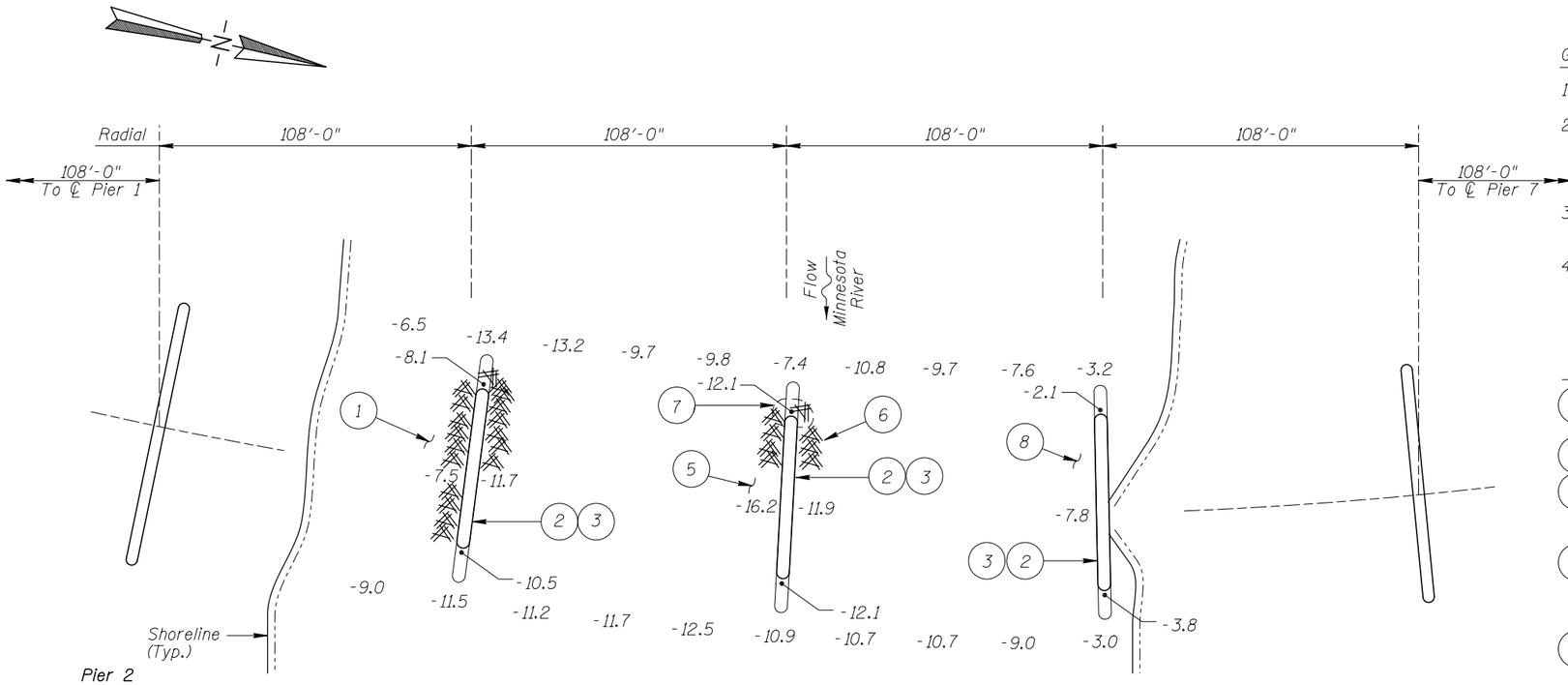
_____Yes X No

Photograph 1. Overall View of the Structure, Looking West.

Photograph 2. View of Pier 3, Looking Northwest

Photograph 3. View of Pier 4 and Timber Debris, Looking Southeast.

Photograph 4. View of Pier 5, Looking Northwest.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 3, 4, and 5 were inspected underwater.
2. At the time of inspection on November 19, 2007, the waterline was located approximately 4.4 feet below top of ledge in shaft at the downstream end of Pier 4. This corresponds with a waterline elevation of 691.1 feet based on design drawings.
3. Soundings indicate the water depth at the time of the inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom at Pier 3 consisted of gravel with silt with up to 1 foot of probe rod penetration.

(2) The concrete was smooth and sound at all of the piers.

(3) Random vertical cracks were observed from the top of the shaft ledge to the channel bottom with efflorescence. There were typically two cracks on each pier at about the third points with 1/8 inch maximum width.

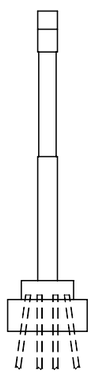
(4) Moderate to heavy accumulation of timber debris consisting of logs and branches 12 to 15 inches in diameter and smaller was observed along the south face, around the upstream nose and to about the midpoint on the north face of Pier 3 extending from the waterline to the channel bottom.

(5) The channel bottom of Pier 4 consisted of silt, gravel, and clay with up to 6 inches of penetration.

(6) A moderate accumulation of timber debris consisting of 12 inch diameter and smaller logs and branches was observed from the upstream nose to the upstream quarter points on both sides of Pier 4.

(7) A scour depression 5 feet in radius by 2 feet deep was observed at the upstream end of Pier 4.

(8) The channel bottom of Pier 5 consisted of clay and silt with 2 to 3 inches of probe rod penetration and also stones 6 inches in diameter located at the upstream end.



TYPICAL END VIEW OF PIERS 3 THRU 5

Legend

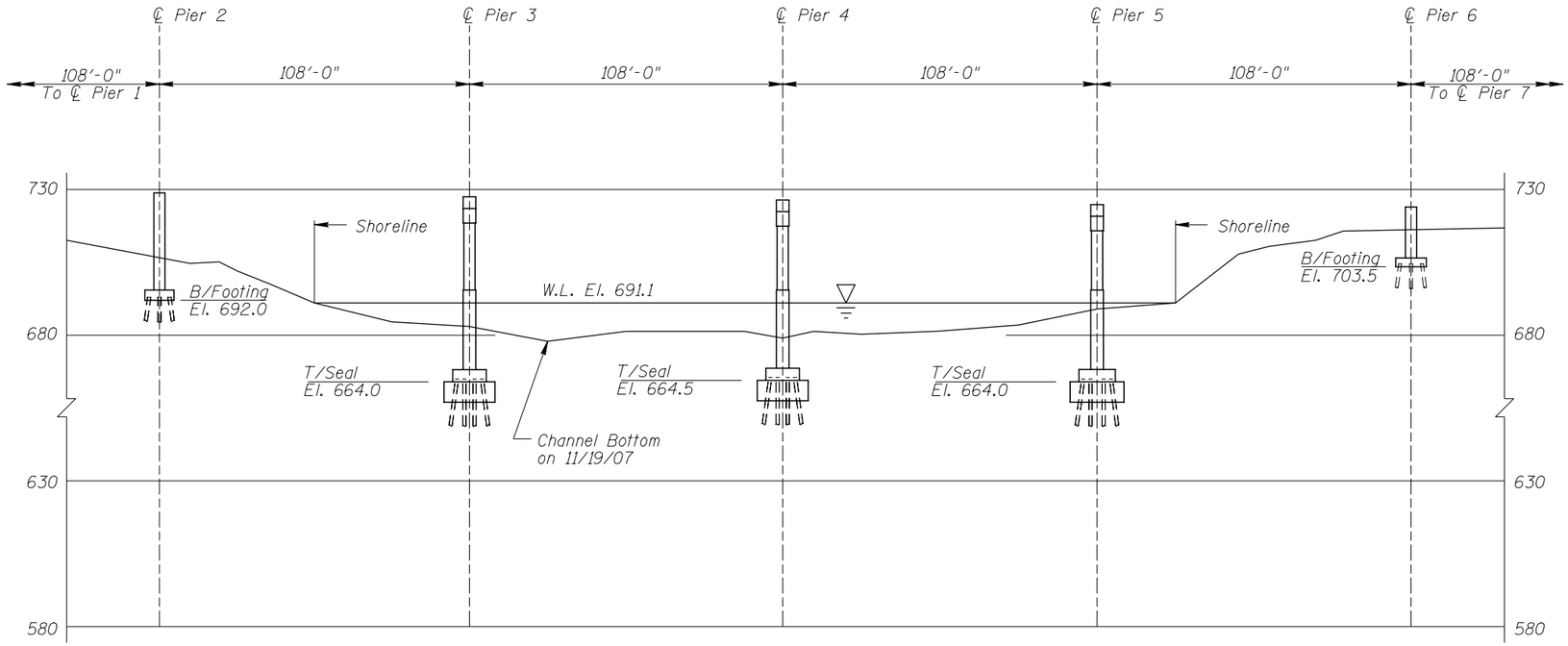
-7.0	Sounding Depth (11/19/07)
	Timber Debris
	Scour Depression

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

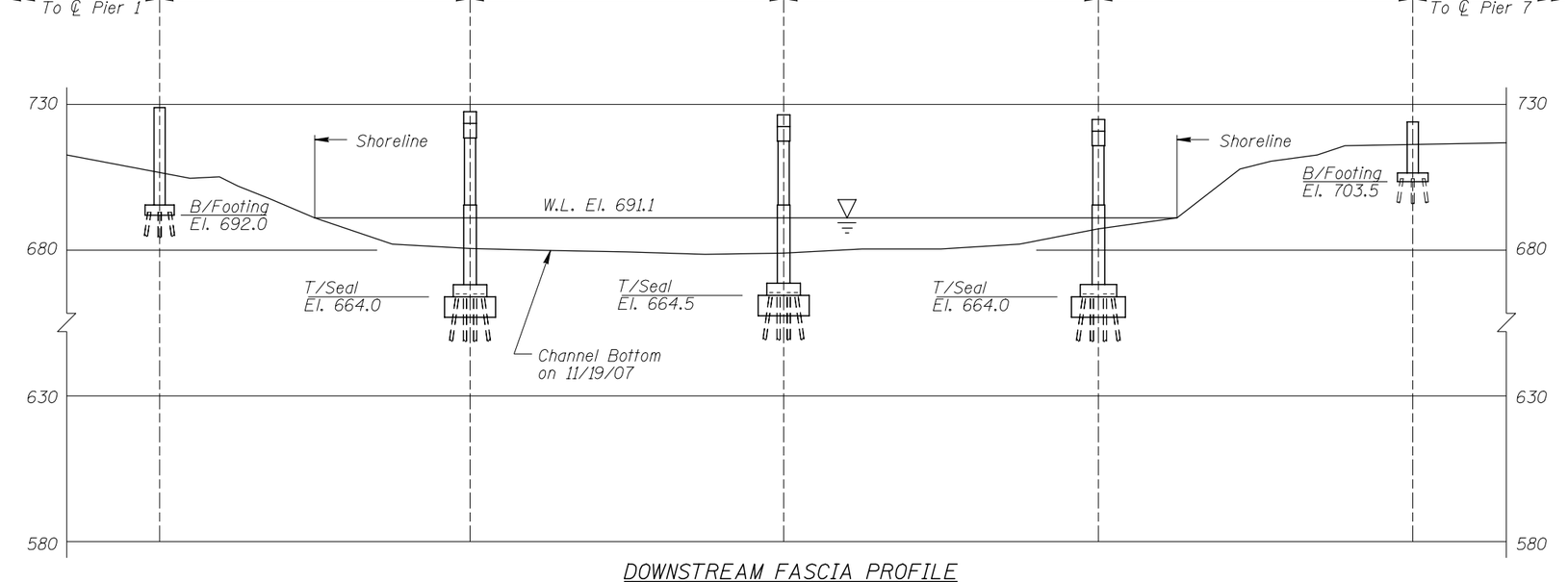
STRUCTURE NO. 70002
OVER THE MINNESOTA RIVER
DISTRICT M, SCOTT COUNTY,
CITY OF SHAKOPEE

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, Inc. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: NOV., 2007
Checked By: MDK		Scale: NTS
Code: 522I70002		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 70002
OVER THE MINNESOTA RIVER
DISTRICT M, SCOTT COUNTY,
CITY OF SHAKOPEE

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS	Date: NOV., 2007
Checked By: MDK	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Scale: 1"=50'
Code: 522140508		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: November 19, 2007
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.
BRIDGE NO: 70002 WEATHER: Cloudy, 50°F
WATERWAY CROSSED: Minnesota River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Clayton G. Brookins, Valerie Roustan
EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, Fathometer, U/W Light, Scraper, Camera
TIME IN WATER: 8:25 a.m.
TIME OUT OF WATER: 9:00 a.m.
WATERWAY DATA: VELOCITY 1.0 f.p.s.
VISIBILITY 0.5 feet
DEPTH 16.2 feet maximum at Pier 4
ELEMENTS INSPECTED: Piers 3, 4 and 5
REMARKS: Overall, the concrete of the piers was smooth and sound. Several random vertical cracks were observed from top of the ledge in the pier shaft to the channel bottom with efflorescence, typically two cracks on each pier at about the third points. A moderate to heavy accumulation of timber debris consisting of logs and branches 12 to 15 inches in diameter and smaller was observed along the south face, around the upstream nose and to about the mid-point on the north face of Pier 3 from the waterline to the channel bottom. A moderate accumulation of timber debris was observed from the upstream nose to the upstream quarter points on both sides of Pier 4. A scour depression 5 feet in radius by 2 feet deep was observed at the upstream end of Pier 4.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the timber debris at the piers, and if found to be increasing in the future, removal operations may become warranted.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 70002
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Minnesota River

INSPECTION DATE November 19, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 3	13.4’	N	7	N	9	N	7	8	8	8	6	6	7	N	N	N	N	N
	Pier 4	16.2’	N	7	N	9	N	7	7	N	N	6	6	7	N	N	N	N	N
	Pier 5	7.8’	N	7	N	9	N	7	8	8	8	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was smooth and sound. Several random vertical cracks were observed from top of the ledge in the pier shaft to the channel bottom with efflorescence, typically two cracks on each pier at about the third points. A moderate to heavy accumulation of timber debris consisting of logs and branches 12 to 15 inches in diameter and smaller was observed along the south face, around the upstream nose and to about the mid-point on the north face of Pier 3 from the waterline to the channel bottom. A moderate accumulation of timber debris was observed from the upstream nose to the upstream quarter points on both sides of Pier 4. A scour depression 5 feet in radius by 2 feet deep was observed at the upstream end of Pier 4.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.